bruCLONE™

User's Guide
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bruCLONE™ User's Guide

TOLIS Group, Inc., et al
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Table Of Contents

What is bruCLONE?.....5
Installation.....6
Product Licensing.....6
bruCLONE Preferences.....7
First Clone.....9
A Note About Drive Attachment.....9
Note on bootable volumes.....12
Special Considerations.....13
Disk-based License Files.....13
Exclude Unnecessary Files - The BRUXPAT File Content Details.....13
Incremental Updates.....14
Time Machine and Spotlight.....14
Intel Mac GUID Disk Partition Table.....14
Restoring From a Clone Volume.....15
bruCLONE License Agreement.....16

What is bruCLONE?

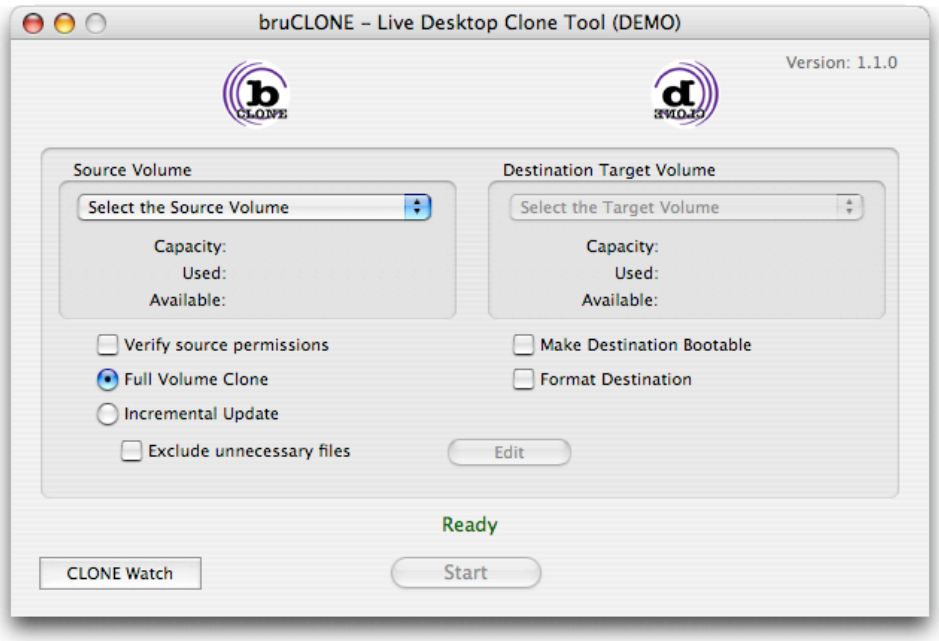

Figure 1 - bruCLONE Main Window

bruCLONE provides a system friendly mechanism for creating cloned, or duplicate, volumes under Mac OS X. Any mounted volume may be selected as the source and any mounted local volume except the boot volume may be selected as the destination. Once complete, the destination volume will contain the same data as the source drive and can be made bootable as part of the clone operation.

bruCLONE will use secondary internal disks (ATAPI, SATA, SAS, or SCSI) or external FireWire and USB drives for cloning. However, only internal drives and FireWire drives (USB on Intel Macs) that are boot-compatible with Macintosh systems can be made bootable.

The default mode of operation is a full clone of the source volume to the destination volume. However, you may also run an incremental update operation that will only update the destination drive with files that have been changed or added to the source volume. bruCLONE is designed to use your system resources in a manner that allows you to remain productive while the clone operation is running. Combined with the BRU engine's ability to process your volumes while the system is live means that you can run clone operations even while you use the system for other work.

In Addition to the normal, full window display, bruCLONE provides a CLONE Watch™ mode that places the bruCLONE "Watch" icon into the status area of the menubar on your primary display. The CLONE Watch operations monitors how long it has been since your last bruCLONE operation and provides a color-coded hint as to the danger level that exists for your cloned environment.

- Green means that your data is relatively safe
- Amber indicates that data lost could occur in the event of a system crash
- Red indicates that recovery to the current state could be impossible.

The time period between each level is user-definable in the Preferences panel.

Installation

The bruCLONE package is a self-contained Mac OS X Application that can be dragged from the installation media into your Applications folder or any other folder that you would like to use.

To start the application, double click the bruCLONE icon. Initially, you will be running in demo mode - bruCLONE provides a 15 day demo period during which all of bruCLONE's features are active.

Product Licensing

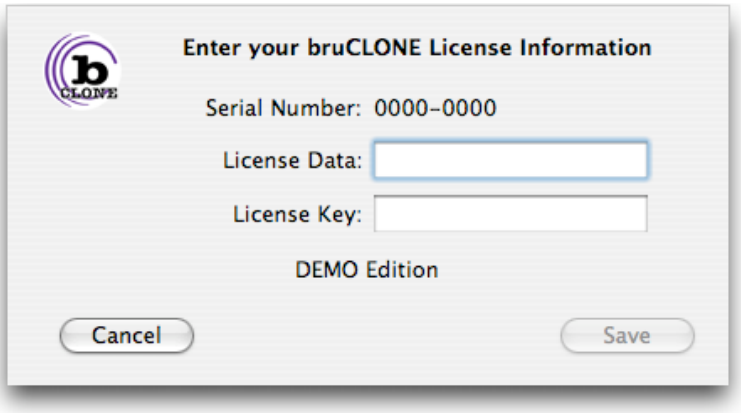

Figure 2 - License Dialog

Upon purchase of a license, enter the license information via the "File" -> "Add License" menu or by holding down the Command and Option keys and pressing the L (⌥-⌘-L). The License dialog will be displayed as shown in Figure 2 above. Enter your License Data and License Key strings into the fields provided. Once entered correctly, the dialog will allow you to save the license.

bruCLONE Preferences

There are preferences that are retained between bruCLONE launches. To access the Preferences panel, select the Application->Preferences menu item, or press Cmd-,.

The General Preferences tab sets the clone operation priority level and the default startup mode.

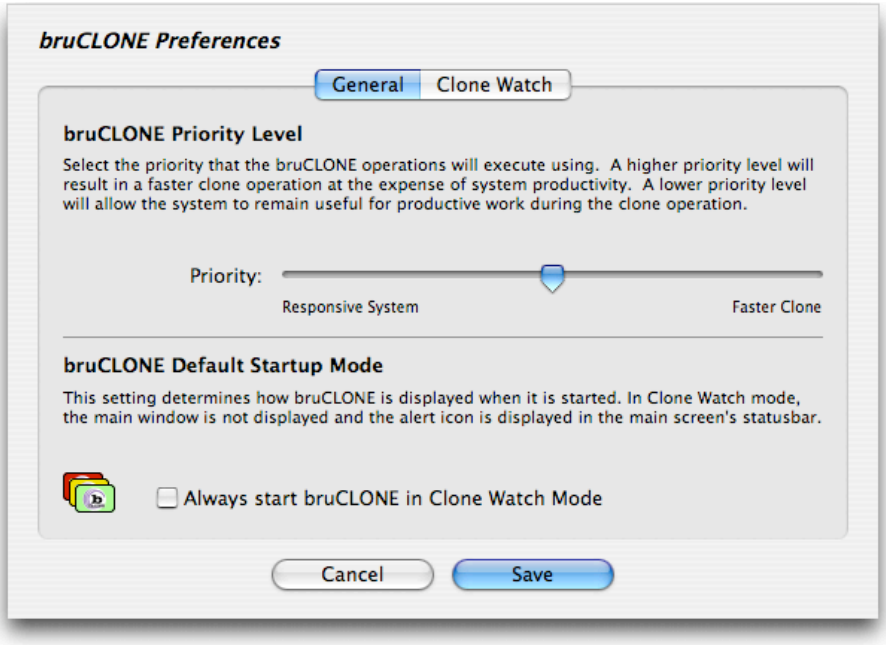
bruCLONE Preferences
General
Clone Watch
bruCLONE Priority Level
Select the priority that the bruCLONE operations will execute using. A higher priority level will result in a faster clone operation at the expense of system productivity. A lower priority level will allow the system to remain useful for productive work during the clone operation.
Priority:
Responsive System
Faster Clone
bruCLONE Default Startup Mode
This setting determines how bruCLONE is displayed when it is started. In Clone Watch mode, the main window is not displayed and the alert icon is displayed in the main screen's statusbar.
Always start bruCLONE in Clone Watch Mode
Cancel
Save

Figure 3 - Preferences: General Settings

The priority level determines how much of the system resources bruCLONE uses during operations (CPU, Memory, I/O). A lower priority allows the system to be more responsive to other applications at the cost of a slower clone process. A higher priority will improve the clone operation performance, but the system may seem sluggish so far as other operations are concerned.

The startup mode specifies whether bruCLONE will start as a full application or simply start in CLONE Watch mode.

When running in CLONE Watch mode, the values set in the CLONE Watch Preferences tab determine the period between the reminder level changes.

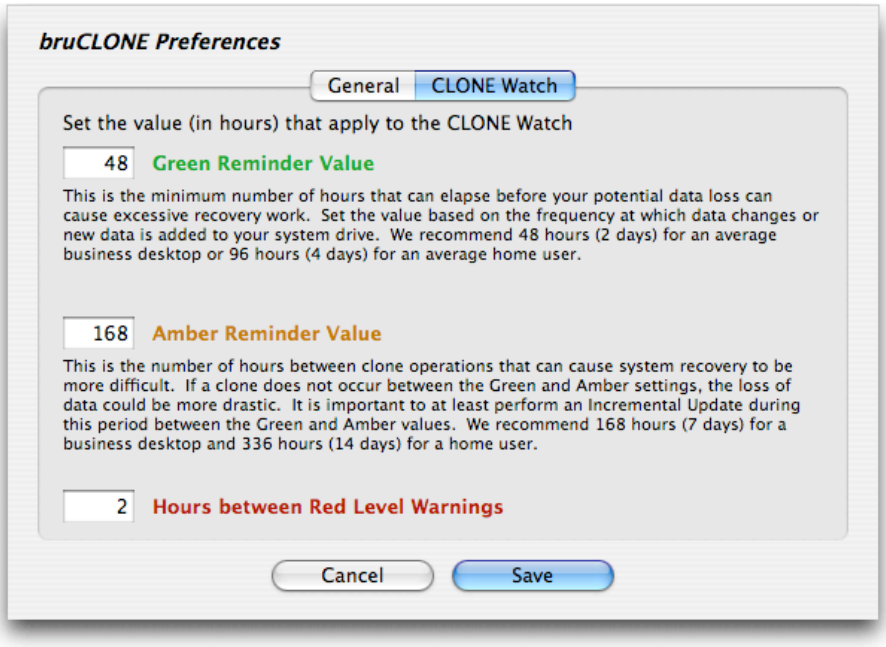
bruCLONE Preferences
General
CLONE Watch
Set the value (in hours) that apply to the CLONE Watch
48
Green Reminder Value
This is the minimum number of hours that can elapse before your potential data loss can cause excessive recovery work. Set the value based on the frequency at which data changes or new data is added to your system drive. We recommend 48 hours (2 days) for an average business desktop or 96 hours (4 days) for an average home user.
168
Amber Reminder Value
This is the number of hours between clone operations that can cause system recovery to be more difficult. If a clone does not occur between the Green and Amber settings, the loss of data could be more drastic. It is important to at least perform an Incremental Update during this period between the Green and Amber values. We recommend 168 hours (7 days) for a business desktop and 336 hours (14 days) for a home user.
2
Hours between Red Level Warnings
Cancel
Save

Figure 4 - Preferences: CLONE Watch Settings

From 0 hours since the last successful clone to the number of hours entered in the Green Reminder Value field, the CLONE Watch icon will have a green background. The number entered in this field should relate to how often you create or change data on the source volume. In simple terms, how many hours could pass after a clone operation before you would lose small amounts of data that wouldn't cause severe hardship.

From the Green Reminder Value to the number set in the Amber Reminder Value determines how long the icon will remain amber before turning to Red and causing the Red Level warning dialog to be displayed.

If the Icon changes to Red, a popup menu will appear warning you to perform and clone operation as soon as possible as shown in Figure 5 below:

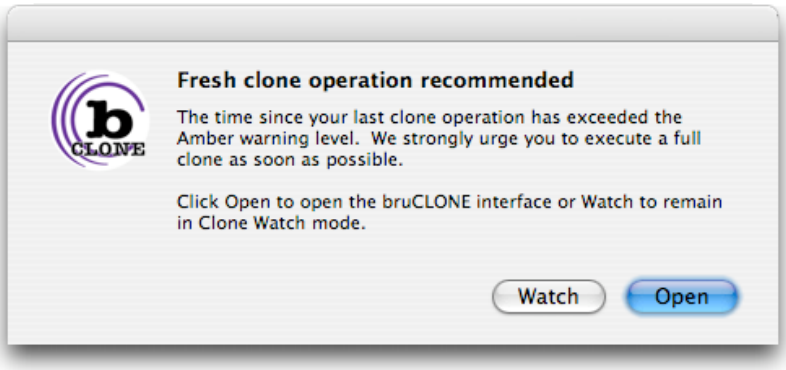
Fresh clone operation recommended
The time since your last clone operation has exceeded the Amber warning level. We strongly urge you to execute a full clone as soon as possible.
Click Open to open the bruCLONE interface or Watch to remain in Clone Watch mode.
Watch
Open

Figure 5 - Red Level Alert Warning Dialog

The final value is the time (also in hours) between appearances of the Red Level warning.

First Clone

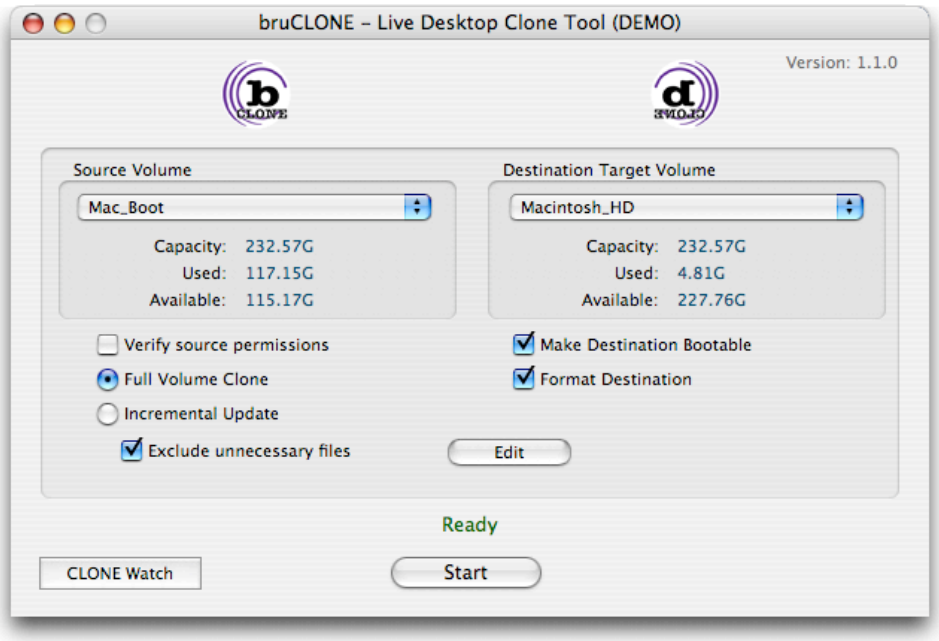

Figure 6 - Preparing for the First Clone

Once your drives are properly mounted and show up on your desktop, start the bruCLONE application and choose your boot volume from the "Source Volume" popup menu.

Since this is our first clone operation, select the "Full Volume Clone" radio button. This will copy all data from the source volume to the destination volume. If you wish to exclude certain files (cache files, tmp files, MP3 files, etc.), check the "Use BRUXPAT exclusions file" checkbox. Editing the contents of this file will be covered later.

It is a good idea to verify and repair the source volume's permissions before performing the clone operation. If the permissions are incorrect on the source volume, they will also be incorrect on the destination volume.

Select the destination volume from the "Destination Volume" popup menu. Once selected, bruCLONE will verify that the destination volume is large enough to contain the data currently on the source volume. In the event that the destination volume is too small, bruCLONE will display the warning shown in Figure 7.

A Note About Drive Attachment

Because bruCLONE requires stability while monitoring the state of the drives to be used, you must make sure that any external drives to be used are attached BEFORE you start bruCLONE. Otherwise, they will not be available for the Clone operation. This is a design decision to lessen the opportunity for selecting the incorrect destination drive for the clone operation. Once a clone operation starts, any data on the destination volume will potentially be deleted during the format operation.

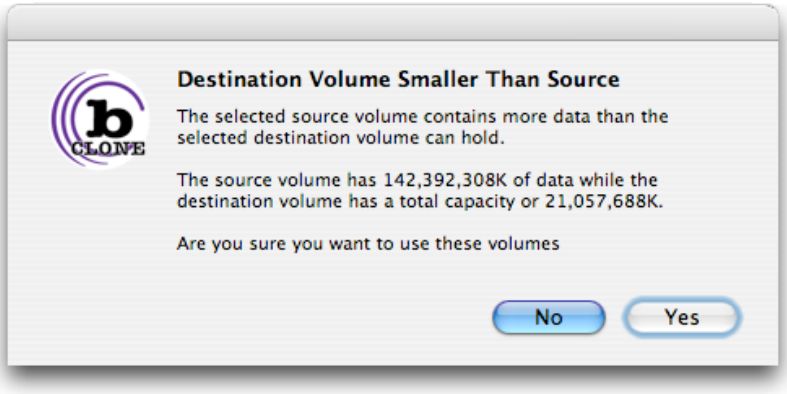
Destination Volume Smaller Than Source
The selected source volume contains more data than the selected destination volume can hold.
The source volume has 142,392,308K of data while the destination volume has a total capacity or 21,057,688K.
Are you sure you want to use these volumes
No
Yes

Figure 7 - Destination Size Warning Dialog

If you will be excluding a large group of files (such as the iTunes library), you may be able to utilize a smaller destination volume.

To make the destination volume bootable, check the "Make Destination Bootable" checkbox. If you wish to format the destination volume (all data will be erased and the volume will be reinitialized with its current volume name), check the "Format Destination" checkbox. bruCLONE will warn you that you will lose all data on the destination volume as shown in Figure 8 below.

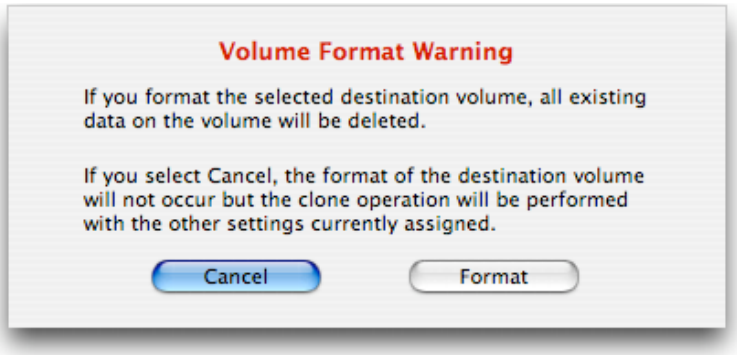
Volume Format Warning
If you format the selected destination volume, all existing data on the volume will be deleted.
If you select Cancel, the format of the destination volume will not occur but the clone operation will be performed with the other settings currently assigned.
Cancel
Format

Figure 8 - Volume Format Warning Dialog

Once your settings are complete, click the "Start" button and the operation will begin. If you have selected to format the destination volume, the dialog shown in Figure 9 will be displayed during the drive initialization.

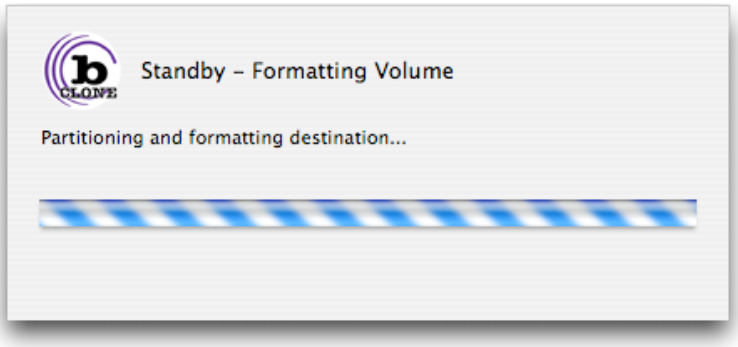

Figure 9 - Destination Initialization Dialog

If you have selected to verify and repair the source volume's permissions, the standby dialog will display the progress of the verify and repair operation as shown in Figure 10.

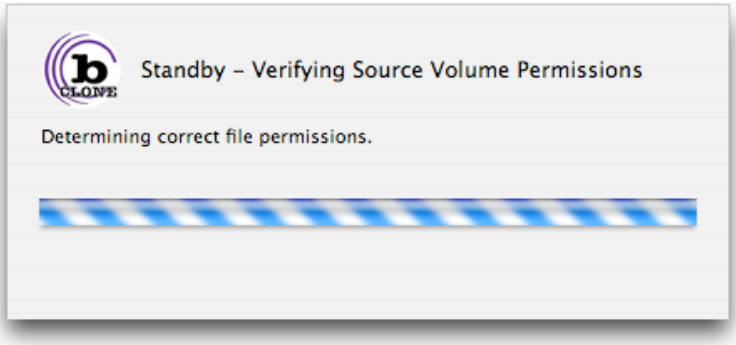

Figure 10 - Source Volume Verification and Repair

Once the initialization of the destination volume completes, the clone operation will begin. The clone progress can be monitored in the main application dialog or in the Status Bar.

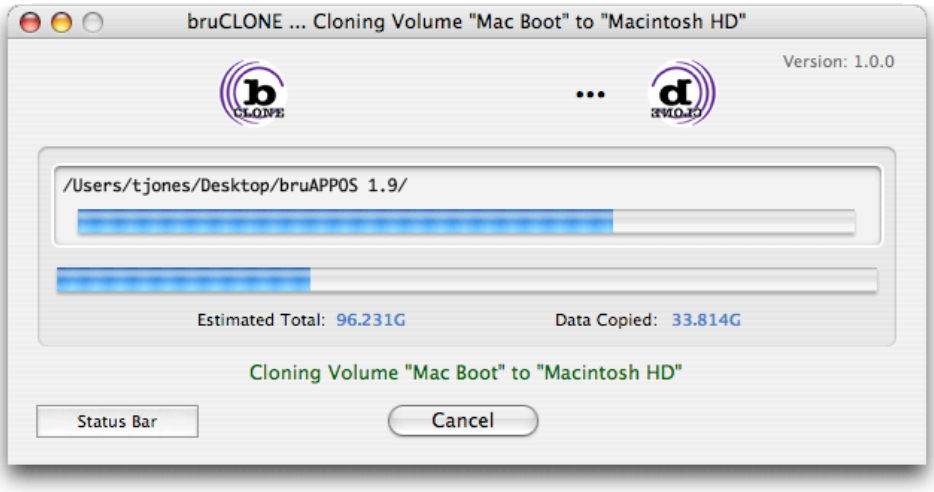

Figure 11 - Clone Operation in the Main Application Window

To get the main window out of your way, you may hide the bruCLONE process (⌘-H), or by clicking on the "Status Bar" button, the main window will be closed and a progress monitor will be placed in the status area of your menu bar as shown in Figure 12.

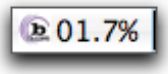

Figure 12 - Status Bar Display

While in the Status Bar monitor mode, the completion percentage will be displayed and the bruCLONE icon will rotate.

When the job completes, the main window will be redisplayed and the completion dialog will be displayed as shown in Figure 13.

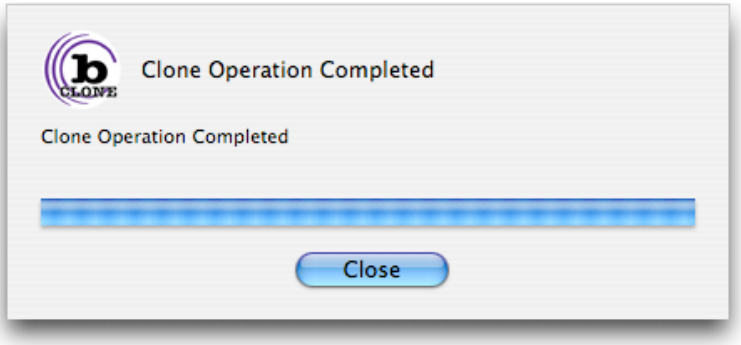

Figure 13 - Clone Operation Completed

Once the clone operation is completed, you may access the destination volume as you would any Mac OS X volume. If the device you've cloned to is supported as a boot device, you may test the volume by selecting it as the Boot Device in the System Preferences "Startup Drive" panel.

Note on bootable volumes

While most major FireWire drives are supported as boot devices under OS X, select units will not boot - specifically those units that utilize the Prolific FireWire to ATAPI bridge chipset. At publication time, TOLIS Group has successfully tested booting from FireWire drives from AComData, Iomega, La Cie, Maxtor, Newer Technology, Seagate, and WiebeTech. There may be others, but we recommend that you test the boot capability before explicitly purchasing a FireWire drive for clone operations.

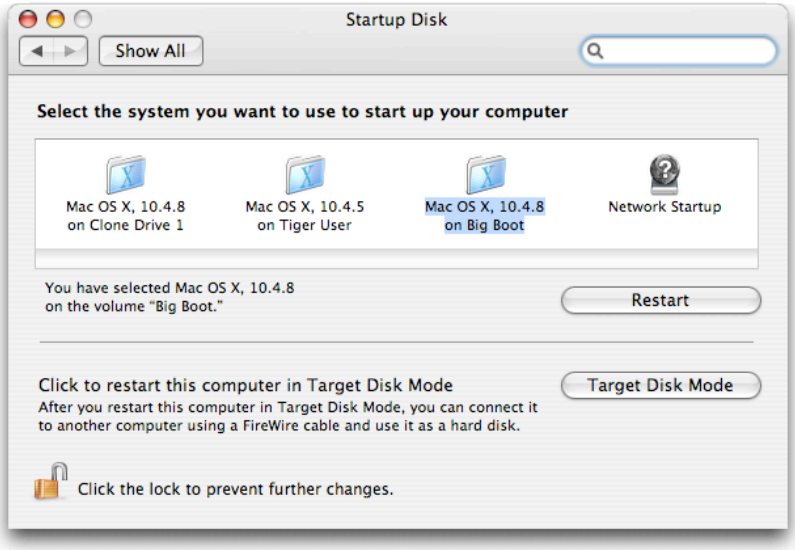
Startup Disk
Show All
Select the system you want to use to start up your computer
Mac OS X, 10.4.8 on Clone Drive 1
Mac OS X, 10.4.5 on Tiger User
Mac OS X, 10.4.8 on Big Boot
Network Startup
You have selected Mac OS X, 10.4.8 on the volume "Big Boot."
Restart
Click to restart this computer in Target Disk Mode
After you restart this computer in Target Disk Mode, you can connect it to another computer using a FireWire cable and use it as a hard disk.
Target Disk Mode
Click the lock to prevent further changes.

Figure 14 - System Preferences Startup Disk Panel

To Test a completed clone operation for bootability, open the System Preferences -> Startup Disk panel and select your FireWire drive. Click the Restart button and you will reboot into the cloned drive.

Once booted, your boot volume will always be the upper drive icon displayed on your desktop.

Special Considerations

Disk-based License Files

Some applications use a license mechanism that combines your license information with the unique identifier of the system root drive (or the drive you're installing the application onto). Even though the bruCLONE clone operation copies the license from your original volume to the destination volume, the destination drive's unique identifier will be different from the original value and your license will be invalid. To resolve this, simply re-license the application with your original license information.

Exclude Unnecessary Files - The BRUXPAT File Content Details

bruCLONE utilizes BRU's BRUXPAT file for defining files that are to be excluded in the clone operation. To edit the contents on the file from within the bruCLONE application, start the application and check the "Use BRUXPAT exclusions file" checkbox as shown in Figure 11.

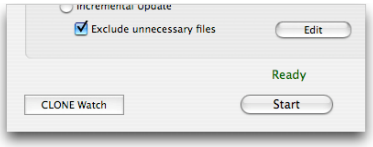

Figure 11 - BRUXPAT Selection

Once checked, the "Edit" push button will be enabled. Click the "Edit" button to open the Excluded Patterns Editor.

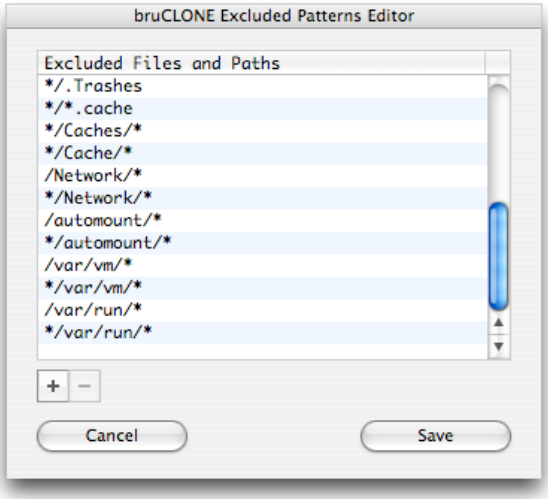

Figure 12 - BRUXPAT Contents Edit Dialog

The default BRUXPAT file that is included with bruCLONE takes into account most unnecessary files, but you may add or remove files based on your specific requirements.

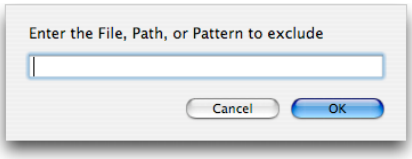

Figure 13 - Add exclusion

Patterns for matching can be explicit patterns such as:

/Users/joesmith/Documents/My Excluded Document.pages

or wildcards may be used:

/.pages

The first example would ONLY exclude the exact file listed while the second would exclude any file (folder, actually for Pages) that ends in ".pages" anywhere on the source volume's filesystem.

To remove an entry from the current list, select the entry in the listbox and then click the "–" button or hit the Backspace or delete key on the keyboard.

Incremental Updates

Incremental updates (select the "Incremental Update" radio button on the main window before beginning a clone operation) allow you to update any new or changed files on the original source volume to the destination volume. When running an Incremental update, bruCLONE will examine the source volume for new or changed files related to the last time a full clone operation was created.

If you are running the incremental update to the original destination volume, the new files will be added and any changed files will replace previous versions. It is not required that you use the same destination volume for an incremental update. By using multiple destination volumes, you can add new files to the clone or save changed files without replacing the original version on the original full destination volume.

For example, if you use a 250GB external FireWire drive to protect an 160GB source drive, you could create 6 partitions on the Firewire drive - a 160GB partition and 5 14GB partitions to store the incremental changes during the week. You could then update the full operation on the large partition followed by incremental updates to each of the smaller partitions during the week.

Time Machine and Spotlight

When bruCLONE clones a Leopard system, it will disable Time Machine for the time it takes the clone operation to complete. This is to prevent Time Machine's disk I/O from interfering with the clone operation.

Additionally, for both Leopard and Tiger systems, Spotlight is disabled on the clone target volume to eliminate the issue of Spotlight trying to index each file that is written to the target volume.

Intel Mac GUID Disk Partition Table

In order to boot an Intel Mac, the boot drive must be partitioned using the GUID partition table. This is done using the "Options" on the Partition Panel of the Disk Utility application.

Restoring From a Clone Volume

To restore files from a clone volume is as simple as locating the file on the clone volume and dragging it back to your primary volume.

To recover a complete volume because of drive failure, repair or replace the damaged volume, boot the system to the cloned drive and then run a reverse clone (i.e.: the external Clone drive is now the source volume while the new internal drive is the destination volume).

bruCLONE License Agreement

The TOLIS Group, INC.
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****
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****

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For bruCLONE, this license is assigned to one specific computer system and may not be used on multiple systems even when not being used on the original system except as outlined in the transferability clause below. If cloning more than one system, one license is required for each system to be cloned.

Transferability to a new computer system is permitted when the original system upon which a given license is currently installed is to be retired, decommissioned, or otherwise taken out of daily utilization by the originally licensed client. It is permissible to retain use of the licensed software on the original system for a period of overlap required to allow the transfer of data from the original system to the replacement system. Once the license has been transferred to the replacement system and the replacement system is placed in normal use, the license must be removed from the original system. At no other time is it allowable to utilize the same software license on two or more different computers at the same time.

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